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Nyctalis asterophora on a *Russula* or *Lactarius*.

Nyctalis duo: "Outlandish Oddballs"

by Tony Wright

"Outlandish Oddballs" are David Arora's words when he starts to talk about two species of mushroom in the genus *Nyctalis*, both of which are to be found in our area but are seldom seen. We have been very lucky—one was found at our recent Cain Foray by Pat Burchell, and the other a little earlier by John Sparling.

These two are clearly odd in that they grow on other dead or decaying mushrooms, but if you examine them closer they are even odder or "outlandish." Dr. James Scott's talk at this year's Cain Foray has set us up to be watchful of mushrooms that grow on other mushrooms, so it is timely to review these two species, especially as we have photos of them and of their strange "spores."

The genus name *Nyctalis* translates as "pertaining to night or darkness," perhaps a reference to the dark putrescent mushroom mass on which they choose to grow. *Nyctalis* is in the same family as *Tricholoma*.

Pat's find at the Cain is known as *Nyctalis parasitica* and is seen occasionally in both North America and Europe. It is rather fussy about the mushrooms it will parasitize, and is generally found only on several species of *Russula* and certain *Lactarius*. It grows in clusters with a very thin, whitish, silky cap up to 2 cm. wide on a stipe of up to 3 cm. tall, on the decaying host mushroom, which is seldom readily recognizable as to species. The guidebooks will give you more details (Barron, p. 270) and reveal that one of its common names is

Silky Piggyback. It has gills, but they are frequently poorly developed such that "normal" spore production from basidia is unreliable. So what is their reproductive solution?

The really odd feature of this mushroom is that the coating of the gills produces "chlamydospores,"—"spores" of a different kind, which are able to create a new fungal organism without a need for mating with compatible spores. "Chlamydo-" translates to "mantle or exterior coat," which is the part of the mushroom that produces these "spores." The accompanying photos show *Nyctalis parasitica* on its host (see page 2; excuse my poor photo), and an enlargement of its smooth fusi-form chlamydospores, each with a large central oil drop (see page 16; photo by Michael Warnock). Your guidebook may have this species under its alternate name, *Asterophora parasitica*.

John captured his find of *Nyctalis asterophora* in the photo on the left. This mushroom, of similar size, also selects as its hosts the genera *Russula* and *Lactarius*, and is seen occasionally in both North

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P R E S I D E N T ' S M E S S A G E

It's Annual Foray time again. While I enjoy the local club forays and the NAMA regional forays, I really look forward to the big foray each year. The mushrooms are only a small part of the experience. First, there is the opportunity to really get away for a few days on a mushroom excursion, something that doesn't happen often enough. Then there is the chance to learn something new from hanging around all of these knowledgeable people. Despite what I have taught my sons, I do not know everything. I will confess this only to fellow mushroomers (and a handful of fishermen) who have the moral character to guard my secret. Mostly, it is the people who draw me back to the Annual Foray each year. Someone told me once that Sam Ristich said he came to the forays for the people; he could find mushrooms outside his back door. I couldn't say it any better. If I'm misquoting you here, Sam, please accept my sincere apology.

This year's foray in Alberta will be memorable if for no other reason than the scenery. I had the great pleasure of being in Hinton (the site of the foray) last August and was amazed at the beauty in every direction. While there, I was accompanied by Louis and Helen Galick and Martin Osis, who have been instrumental in planning our upcoming foray. I strongly suggest that if you can find the time either before or after the foray, you spend a few extra days in the Jasper National Park exploring. The natural beauty of the Canadian Rockies cannot be overstated. (They're almost as beautiful as the Blue Ridge Mountains of North Carolina and Virginia.) I would recommend a day in Jasper, another around the Lake Louise area, and a third around Banff. There are several stops along the way between these destinations that should not be missed either, particularly around the Ice Fields.

One of the highlights of my visit last year was a few hours spent mushrooming along a high ridge just outside of Hinton with Louis, Helen, and Martin. For a boy from the clay soil of North Carolina, it was a fascinating change of terrain. Everywhere the ground was covered by a lush undergrowth of mosses unfamiliar to me, small animal dens, and mushrooms, most of which left me scratching my head. I'm sure my companions got tired of my saying, "I've never seen that before."



Nyctalis parasitica (See page 1.)

Treading on the mosses and decaying forest floor had a spring feel similar to walking on the tundra in Alaska. I am anxious to get back into those woods again, especially with my NAMA friends. I hope to see you there!

—Ike

Moving?

Please send your new address, **two weeks** before you move, to

Ann Bornstein
NAMA Membership Secretary
336 Lenox Avenue
Oakland, CA 94610-4675
<Membership@namyco.org>

Otherwise—you may not be getting your newsletter for a while. Each issue, several *Mycophiles* are returned as undeliverable because of no forwarding address on file. NAMA is charged **seventy cents** for each returned or forwarded newsletter.

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Mycophile Community Suffers Serious Loss

Just as this issue was going to press we received word that Dr. Orson Miller had died June 9 as a result of a brain tumor diagnosed last fall.

"Orson was North America's first mycology superstar, who made numerous contributions to professional and amateur mycology. He was also past president of the MSA, and has received many lifetime teaching and research awards," said Judy Roger, president of NAMA.

The family will hold a private service this summer. Our Sept./Oct. issue will have more information concerning public memorials and the graduate student endowment in Orson's honor to which donations may be sent. We extend to Hope and family our deepest sympathy.

2006 Mycology and Lichenology Seminars at Humboldt Institute Steuben, Maine

For more information, contact the Humboldt Institute, P.O. Box 9, Steuben, ME 04680-0009; tel. (207) 546-2821; fax (207) 546-3042; e-mail <mailto:office@eaglehill.us>. Online registration and information can be found at www.eaglehill.us, or see the Mar./Apr. 2006 issue of *THE MYCOPHILE*. An overview of this year's seminars:

July 16-22

Crustose Lichens: Identification Using Morphology, Anatomy, and Simple Chemistry

July 23-29

Slime Molds: Taxonomy and Ecology of Myxomycetes

Sept. 3-9

The Fruticose Lichen Genus *Usnea* in New England

Sept. 10-16

Intermediate Mushrooms for Naturalists

Oct. 2-6

Development of Electronic Natural History Identification Guides

New Summer Forays in Mexico

July 9-16

Sierra Gorda Ecological Preserve, Queretaro

August 6-13

Benito Juarez National Park, Oaxaca
For more information see the May/June issue of *THE MYCOPHILE*; check their website, www.mexmush.com; or call (from U.S./Can.) 011 52 (246) 461-8829.

Joint Annual Meeting of Mycological Society of America, Canadian Phytopathological Society, and American Phytopathological Society Québec City, Québec, Canada July 29-August 2

NAMA Annual Foray William Switzer Provincial Park Hinton, Alberta, Canada August 17-20

Details can be found at the NAMA website and inside this issue.

8th International Mycological Congress (IMC8) Cairns, Australia August 21-26

Details can be found on the website, www.sapmea.asn.au/imc8.

New Mexico Mycological Society Annual Foray, Los Alamos August 24-27

Details in the May/June issue of *THE MYCOPHILE* or at the NMMS website, www.mycowest.org.

COMA's 30th Clark Rogerson Foray Moodus, Connecticut August 24-27

For information see the May/June issue of *THE MYCOPHILE* or contact Don Shernoff at <donshernoff@yahoo.com> or (914) 761-0332.

Alaska's Wild Mushrooms August 25-27

Contact owners Mary Jane and Tony Lastufka at (907) 235-3633/345-2571; visit their website at www.tentandbreakfastalaska.com; or e-mail them at <ecotour@ptialaska.net> for more information; see also the Mar./Apr. '06 issue of *THE MYCOPHILE* for details.

Alpine Mushroom Foray Bavaria August 31-September 11

See the Posh Journeys website, www.poshjourneys.com; contact Freia Bradford at (719) 784-3838 or e-mail <freia@redgeckointernet.net> or Helga at (775) 852-5105 or e-mail <contact@poshjourneys.com>. For details, see the Jan./Feb. issue of *THE MYCOPHILE*.

NEMF Annual Foray Lac Bouchette, Canada September 1-4

For details see the NAMA website, www.namyc.org or the NEMF websites, www.mycomontreal.qc.ca and www.nemf.org.

Asheville Mushroom Club Mushroom Fair September 9

For information, see the May/June issue of *THE MYCOPHILE* or contact Sheila Dunn, phone (828) 645-3661, or e-mail <sdunn@charter.net>.

Foray Newfoundland & Labrador Avalon Peninsula, Newfoundland, Canada September 15-17

For information and registration see their website, www.hnhs.ca/mushrooms, or see the March/April 2006 issue of *THE MYCOPHILE*. Faculty will be Michael Burzynski,

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Forays & Announcements,
cont. from page 3

Dave Malloch, Faye Murrin, Ron Peterson, Stan Piedad, Greg Thorn, Andrus Voitk, Tom Volk (health permitting), and Gary Warren (others TBA: check the website).

Wildacres Regional NAMA Foray
Wildacres, North Carolina
September 28–October 1

Participants at this foray will be limited to 50 persons, double occupancy. There are no private rooms. The cost of the foray is \$200 and covers 3 nights lodging and 8 meals beginning with an evening meal on Thursday, September 28, and ending with breakfast on Sunday, October 1. Registration form can be found in this issue of *THE MYCOPHILE* or at the NAMA website, www.namyc.org. For additional information contact Allein Stanley at <wildacres @namyc .org>.

Good News from Tom Volk

"Hi, Everyone. After what was apparently a successful heart transplant, I was "released" from the hospital today and moved into the Gift of Life Transplant House—sort of like a Ronald McDonald house for adults. I will have to stay in Rochester for a couple months, and I'm not sure when I can even travel out of the city for short times, maybe after a month. They're still keeping pretty close watch on me, and I even have to go for blood tests this weekend and four days next week. My heart rate has gone up some (this is good, as it had been low) as I try different drugs and their combinations. No pacemaker for now. My new heart is very strong, and sometimes it feels like it's pounding in my chest with much more force than my old crummy heart did. . . It's only going to get better from here.

I can have visitors. Anyone who would like a vacation in Rochester, MN, for a day, a few days, or a week during the summer, I'll be

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Mac Is Back!

Spring 2006 marks the return of *McIlvainea* after many years' absence! All NAMA members will be receiving a copy shortly. Although it has taken longer for Judith and me to put it together (I'll be the first to admit when I don't know what I'm doing), I am confident that you'll be pleased with our efforts, as well as with the efforts of those who contributed the tremendous articles. The next issue is planned for fall and will be a tribute to Elizabeth Moses. —Britt

Last Chance to Nominate Officers!

President Ike Forester, First Vice-President Bob Fulgency, and Treasurer Judith McCandless have all indicated a willingness to serve another term in their respective positions. Other nominations may be submitted by the general membership. The nominations must be received prior to the 2006 NAMA Annual Meeting in August for distribution to the Trustees.

A nomination must include in writing: (1) the nominee's consent to serve, and (2) a brief biographical description of the nominee's qualifications and experience.

Environmentally sensitive protein proves key to making yeast pathogenic.

Researchers have revealed a single gene that sets in motion a pernicious makeover whereby human body heat triggers the transformation of a handful of common soil molds from a benign fungus to a pathogenic yeast.

In the April 28, 2006, issue of the *Science*, researchers Julie C. Nemecek, Marcel Wüthrich, and Bruce S. Klein published the results of a study that helps to explain how microbial pathogens that normally inhabit our environment can adapt to thrive inside mammalian hosts. There are six dimorphic fungi that cause disease worldwide: *Blastomyces dermatitidis*, *Coccidioides immitis*, *Histoplasma capsulatum*, *Paracoccidioides brasiliensis*, *Sporothrix schenckii*, and *Penicillium marneffei*. Fungi that are dimorphic can switch from nonpathogenic molds in soil to pathogenic yeast after spores are inhaled and exposed to elevated temperature. Mechanisms that regulate this switch remain obscure. The researchers show that a fungal chemical (a kind of kinase enzyme) senses host signals and triggers the transition from mold to yeast. The kinase also regulates cell-wall integrity, sporulation, and expression of virulence genes in vivo. This global regulator shapes how dimorphic fungal pathogens adapt to the mammalian host, which has broad implications for treating and preventing systemic fungal disease.

Unraveling the problematic genus *Agaricus*. *Agaricus* section *Xanthoderma* comprises a group of species allied to *A. xanthodermus* and generally characterized by basidiomata having phenolic odors, transiently yellowing discolorations in some parts of the basidiome, Schaeffer's reaction negative, and mild to substantial toxicity. The section has a global distribution, while most included species have distributions

restricted to regions of single continents. Using specimens and cultures from Europe, North America, and Hawaii, a group of researchers from the U.S.A., France, Spain, and the U.K., led by Richard Kerrigan of Sylvan Research in Pennsylvania, analyzed DNA sequences from among members of the section and with representative taxa from other sections of the genus. The study (*Mycologia*; 97[6]: 1292–1315) determined 21 discrete entities in *Xanthoderma*, including 14 established species and seven new ones, three of which are described elsewhere. Four species from California, New Mexico, and France deserve further study before they are described. Type studies of American taxa are particularly emphasized, and a lectotype is designated for *A. californicus*. Section *Xanthoderma* formed a single clade in most analyses, indicating that the traditional sectional characters noted above are good unifying characters which appear to have arisen only once within *Agaricus*.

Deciphering the distribution history of *Amanita muscaria*. I would bet that 99% of our readers already knew that *Amanita muscaria* has a wide geographic distribution—it occurs in Europe, Asia, Africa, Australia, New Zealand, and North, Central, and South America. Previous studies have shown that three geographic clades (i.e. 'Eurasian,' 'Eurasian-alpine,' and 'North American' groups) exist within *A. muscaria*. But did you know that the historical dispersal patterns of *A. muscaria* are pretty much unknown?

In a recent issue of the journal *Molecular Ecology*, Geml *et al.* (15[1]: 225–39) set out to shed some light on this mystery. They collected specimens from arctic, boreal, and humid temperate regions in Alaska, extracted DNA from their samples, and compared the DNA sequences to those of homologous sequences

from additional *A. muscaria* isolates kept in the big international DNA sequence repository called GenBank. Although the researchers confirmed the existence of the three above-mentioned clades, representatives of all three groups were found to occur sympatrically in Alaska, suggesting that they represent cryptic phylogenetic species with partially overlapping geographic distributions rather than being allopatric (that is, completely separated) populations. All phylogenetic species share at least two morphological varieties with other species, suggesting ancestral polymorphism in pileus and wart color pre-dating their speciations.

So what does this mean? It seems that the ancestral population of *A. muscaria* likely evolved in the Siberian-Beringian region and underwent fragmentation. The data suggest that these populations later evolved into species and expanded their range in North America and Eurasia. In addition to range expansions, populations of all three species remained in Beringia and adapted to the cooling climate.

Humans are not the only primate mycophages! Though ≥ 22 species of Primates consume fungi, most do so at low rates, during less than five per cent of their feeding time. Goeldi's monkeys (*Callimico goeldii*), spend up to 29% of their feeding time year-round consuming fungal sporocarps, the fruiting bodies of fungi. Hanson *et al.* report in the latest issue of *International Journal of Primatology* (27[1]: 323–46) comprehensive data on the nutritional characteristics of 4 species of fungi consumed by *C. goeldii* (*Ascopolyporus polyporoides*, *Ascopolyporus polychrous*, *Auricularia auricula*, and *Auricularia delicata*). The composition of the fungi is similar to that of other fungi:

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Fungi in the News, cont. from page 5

predominantly fiber (66.2–83.0% dry matter) with small amounts of sugar (2.0–5.6% dry matter) and crude fat (0.9–1.6% dry matter). Though the crude protein content is substantial (5.5–13.4% dry matter), much of the nitrogen in the fungi is not likely to be available to *C. goeldii* because it is associated with indigestible food components or is in nonprotein form. The mineral content of the fungi is within the normal range for fungi generally, and the calcium-to-phosphorus ratio is low (0.07–0.25).

With its silky black fur, the Goeldi's monkey is a little larger than a squirrel, and its characteristics closely resemble those of marmosets and tamarins. This monkey was discovered in 1904 and given the name *Callimico*, which means "beautiful little monkey." Its head is round with hairless ears, usually covered by the hair crown, which is puffed out. Besides fungi, its diet consists of fruits, insects, bird eggs, and small vertebrates. Gestation period is 4.5 to 5 months, and only one young is born per litter. These monkeys live in the tropical rainforests of the upper Amazon River in South America.

Fungi appear to be a low-quality food resource for *C. goeldii* and may

contribute to their relatively large home ranges and low population density compared to other *Callitrichinae*. Research on the ability of Goeldi's monkeys to digest fungi is needed to understand fully the nutritional value of fungi to them. The authors discuss adaptations *C. goeldii* may have for improving their ability to obtain nutrients from fungi and potential ecological correlates of mycophagy. It also would be interesting to learn how the fungi have coevolved with the mycophagous monkeys; are the fungi benefiting in any way from the monkeys—say, through spore dispersal?

And speaking of mycophagy . . .

Cord-forming basidiomycetes are important decomposers of dead wood in forest ecosystems, but the impact of mycophagous soil invertebrates on their mycelia is little known. In a recent issue of the journal *Mycological Research*, Tordoff *et al.* (110[3]: 335–45) report the effects of different grazing intensities of Collembola (tiny primitive insects) on mycelial foraging patterns of the saprotrophic cord-forming basidiomycetes *Hypholoma fasciculare* (the ubiquitous sulfur tuft), *Phanerochaete velutina* (a common resupinate white rotter), and *Resinicium bicolor* (another common white rotter) growing from beech (*Fagus sylvatica*) wood block inocula in dishes of non-sterile soil. Collembola are completely unseen and unknown to the average person, yet they are some of the dominant animal species in the forest. Mycelial extension rate and hyphal coverage decreased with increased grazing intensity. *Resinicium bicolor* was most affected, high grazing density resulting in only a few major cords remaining. Grazing of *H. fasciculare* often resulted in points of more rapid outgrowth as cords with a fanned margin. In grazed mycelia of *P. velutina* the main cords had fanned tips and lateral cords became branched. These results suggest that mycophagy by Collembola may hinder the growth of cord-forming fungi in

woodlands, which might impact on the ability of these fungi to forage for and decompose dead organic material.

Also from *Mycological Research*, Virag and Harris look for answers to that age-old question, "What the heck is a Spitzenkörper, anyway?" in their paper "The Spitzenkörper: A Molecular Perspective" (110[1]: 4–13).

Beetles, too, eat fungi—to stay

healthy. Insects require sterols for normal growth, metamorphosis, and reproduction, yet they are unable to synthesize these organic compounds and are therefore dependent upon a dietary source. For phloophagous species—such as bark beetles (famous for spreading the fungal cause of Dutch elm disease, *Ophiostoma ulmi*, which has wiped out most American elms in North America)—whose food does not necessarily contain appropriate types or adequate quantities of sterols, fungal symbionts may provide an alternative source in the form of ergosterol.

In the latest issue of the *Annals of the Entomological Society of America* (99[2]: 189–94) Barbara J. Bentz and Diana L. Six determined the ergosterol content of host tree phloem naturally infested with larvae (and their fungal symbionts) of bark beetles and compared it to ergosterol contents in uninfested phloem tissue. Mycelia of *Ophiostoma montium* and *O. clavigerum* isolated from bark beetle mycangia (little pouches on the underside of the adult beetles that have evolved to carry fungal tissue from tree to tree) contained relatively large quantities of ergosterol, although no significant differences in content were found among these and other fungal species tested. Phloem colonized by beetle larvae contained significantly more ergosterol than did uninfested host phloem tissue. Their results suggest that larval life stages of bark beetles may obtain vital nutrients not only from the host tree phloem but also from fungal symbionts, in the form of ergosterol, while mining larval galleries.



A cuddly Goeldi's monkey at Milwaukee Zoo. Photo by Britt Bunyard.

Fungi of the Antarctic: Evolution under Extreme Conditions. G. S. de Hoog, ed. *Studies in Mycology* 51:1-79. Utrecht, The Netherlands: Centraal-bureau voor Schimmelcultures, 2005. ISBN 90-70351-55-2.

Like most folks, when it comes to life in the Antarctic, I know very little. But like most mycologists I am keenly aware that fungi are known to occur in just about every corner of the Earth, and Antarctica is no exception—but just barely. Despite being at the very limits of where organisms can eke out a living, Antarctica does support members of the Fifth Kingdom. And, as elsewhere, the fungi there can be found in aquatic environments and terrestrially. "Aquatic" here means they're covered with ice most of the time. And by "terrestrial," I don't mean *on* the surface of rocks, I mean *in* the rocks.

Just a few paragraphs into *Fungi of the Antarctic* and I quickly realized there is much to be learned about Antarctic mycology. And if you're a neophyte or expert this book is a great place to turn to for information.

Basically, *Fungi of the Antarctic* is an assemblage of two research papers by several experts in the field. The first paper, "Fungi at the edge of life: cryptoendolithic black fungi from Antarctic desert," discusses the terrestrial fungi that occur there. Interestingly, fungi of the Antarctic are more apt to occur within porous rock—typically, sandstone—rather than on the surface as lichens would in much of North America. This is because the microclimatic conditions just under the surface of rocks are somewhat buffered thermally and not subjected to such wide thermal fluctuations as are the sterile surfaces of Antarctic rocks. In addition to physiological and growth habits in culture, the authors have determined the phylogenetic positions for these curious fungi, based on DNA sequence analysis.

The second paper, entitled

"Evolution, taxonomy and ecology of the genus *Thelebolus* in Antarctica," covers the fungi that dominate the aquatic regions of the continent, at least so far as is known. Fungi of this genus (worldwide) are typically found in association with mammal dung and often in cold climates. In Antarctica, species of *Thelebolus* seem to have moved into birds as their animal host. In the environment, they form pink mycelial mats on the bottom of frozen lakes.

The authors of both papers hypothesize on the possible course of evolution for these fascinating organisms. But why study Antarctic fungi? Aside from describing some new species (which both groups have done, herein) and some uncommon lifestyles, what's to be gained from investigating fungal life—or any life, for that matter—on the Seventh Continent? Possibly, quite a bit! Of course, there is always interest in extremophiles as a source of novel antimicrobials or other important biomolecules (where would we be without DNA polymerases isolated from thermophiles?). But there are some other "far out" reasons to explore life in the Antarctic. Some of the harsh Antarctic deserts are among the Earth's closest analogues to that of Martian environments. And it seems that Martian exploration, in general, and the search for life there, to be specific, is quite popular these days. Although the consensus is that Mars is currently inhospitable to life as we know it, it is thought that the Red Planet may have been more permissive in the past. The possibility that life is preserved there in a resting form cannot be ruled out; thus, determining the limits of life on Earth is a logical area of study.

—Britt A. Bunyard

[See photos from this book on page 15. The article originally appeared in MSA's *Inoculum* (2006; 57[2]: 12-13); it is reprinted here with permission.]

***Fungi of Switzerland*, Vol. 6** (Russulaceae) by Fred Kränzlin. Lucerne: Edition Mykologia, 2005. 317 pp. ISBN 3-85604-260-1 (English version). 158 Swiss francs (CHF), plus 23 for shipping to U.S.

I began my review of Volume 5 in this series (*THE MYCOPHILE* 42[3], May/June '01) by saying, "There's both good news and bad news to report," and that's also true with respect to Volume 6. First the good news—the latest of the "Swiss books" is now available. The bad news is that it is the final volume of this fine project produced by a small group of Swiss amateur mycologists; there are no more to look forward to. Also in the bad news category is the fact that our dollar is not doing as well in late 2005 as it was in 2001 so, although the price for this volume is the same in Swiss francs as the last two, it will cost U.S. buyers about 25% more.

This is the last volume in a series that documents the macro-fungi of Switzerland. The previous five volumes cover the larger ascomycetes (Vol. 1); the non-gilled fungi—jellies, polypores, chanterelles, corals, puffballs, and the like (Vol. 2); the boletes and a portion of the agarics—Hygrophoraceae, Tricholomataceae, and gilled Polyporaceae (Vol. 3); another portion of the agarics—Entolomataceae, Pluteaceae, Amanitaceae, Agaricaceae, Coprinaceae, Bolbitiaceae, and Strophariaceae (Vol. 4); and the Cortinariaceae (Vol. 5). Coverage concludes here with the Russulaceae (*Russula* and *Lactarius*). Altogether, over 2,400 species are described and illustrated, including 218 in the last volume. The earlier volumes all have been praised for their high quality, and the new release does nothing to detract from the series's well deserved reputation.

The format is essentially the

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STRANGE BUT TRUE!

Mushroom Parasites

by Britt Bunyard

I: The Spore-Eating Fungus, *Sporophagomyces*

I first heard of the bizarre fungus called *Sporophagomyces* during a talk by Dr. Daniel Lindner Czederpiltz of the USDA Forest Products Lab in Madison, Wisconsin. This strange creature (the fungus, not Dan!) makes a living by capturing and consuming the spores of other fungi—notably, the basidiospores of shelf-like polypores hanging off the side of trees. It seems the parasite grows as a hyphal mat just below the hymenial surface of the polypore and catches the spores as they drop from its host. There are a few species in the genus *Sporophagomyces*; none of them particularly well known. Just about all that is known was published by Dr. Gary J. Samuels of the USDA-ARS Systematic Botany and Mycology Lab, in Beltsville, Maryland. The type species, *S. chrysostomus* (pictured on page 9; photo courtesy of D. Lindner Czederpiltz, taken in Belize), was known for a long time as *Hypomyces chrysostomus*. These fungi occur on members of the Ganodermataceae and are most conspicuous for the production of the anamorph on the underside of the conk, which starts out white and cottony and produces conidia. Later it becomes brown as basidiospores are trapped in it. The anamorph of *S. chrysostomus* has been called *Bombycina institale*. Often this peculiar growth is removed from the polypore and preserved as a herbarium specimen, thus obscuring the identity of the host.

II: The Fungus That Loves the Oak-loving Fungus

The Collybia Jelly fungus, *Syzygospora mycetophila* (though you probably know it by its former name, *Christiansenia mycetophila*), parasitizes the ubiquitous mushroom *Gymnopus dryophilus* (which you may know from its previous name, *Collybia dryophila*), creating pale, jelly-like growths on the stem, gills, and cap. These growths look like strange tumors on its host (which you might feel sorry for, were it not for the fact that it's usually the most common mushroom in the woods!)—but I digress. In the past, *Syzygospora* was actually thought to be a jelly fungus and went by the name *Tremella mycetophila*. The Mushroom Expert website, run by Michael Kuo (author of the wonderful new book *Morels*), states that "Apparently *Syzygospora mycetophila* is not, strictly speaking, the stuff that we see on the mushroom; the jelly-like growths are composed of tissue from the mushroom itself and are induced by the parasite, which uses them for its own ends." And that, dear readers, usually means reproduction and spore dispersal. The photo below is by David Work and won the First Place Award in the 2005 NAMA Digital Photo Contest.



Collybia dryophila with *Christiansenia mycetophila*.



Sporophagomyces chrystotomus specimens from Belize

Book Reviews, continued from page 7

same as that of the earlier volumes. After the preface by mycologist Henri Cléménçon, translators' note, and author's foreword, the book includes an introduction and synopsis of the taxonomic arrangement, spore-color chart, study methods, glossary, lists of abbreviations and symbols used, abbreviations of taxonomic authors' names, and both Latin and English names for the plants that appear in the habitat descriptions. This is followed by a set of dichotomous keys to the included taxa and the species descriptions. The book concludes with an extensive bibliography, index, and a cumulative appendix with keys, family and genus lists, and an index to the entire series.

The keys are based on a combination of macroscopic features and basic microscopic observations, such as spore shape, ornamentation, and dimensions. The floristic part represents the main body of the book, and it will look familiar to users of the previous

volumes, with one major exception: Previously, species descriptions were arranged three per two-page spread, one above another. Here there are only two species per two-page spread. As usual, on the left-hand page is the fungus's name, including author, a short list of synonyms, a symbol denoting edibility, and the text description. Each description includes information about habitat; macroscopic features of the pileus, flesh, lamellae, and stipe; microscopic features; taxonomic remarks such as how to distinguish similar species; and source and date of the collection. On the right-hand page are clear line drawings of microscopic features including spores, basidia, cystidia, and pileipellis, and a high-quality color photograph, usually taken *in situ* so that visual information about habitat is conveyed. The spore-print color swatches used in Volume 4 have returned, given the importance of spore-print color in separating species within the Russulaceae.

This is another very nicely produced book—highly informative, aesthetically pleasing, and useful for, as well as usable by, amateurs and professionals alike. At over \$100 it isn't cheap; however, its high quality and value make it worth the price. If you're serious about identifying mushrooms, you'll find the set indispensable. —Steve Trudell, Seattle, Washington

[Note: For those interested in filling in missing volumes in your collection, all are still available in English, German, or French at the following prices: Volume 1 (118 CHF), Volumes 2 and 3 (148 each), and Volumes 4 and 5 (158 each). Shipping is 23 CHF for the first book ordered, and 14 for each additional book. Visa and MasterCard accepted. Contact Verlag-Edition Mykologia Lucerne, P.O. Box, CH-6000 Lucerne 6, Switzerland.]



Continued on
page 10

NAMA WILDACRES REGIONAL FORAY

September 28–October 1, 2006

Wildacres, North Carolina

To register, complete this form and mail with a check for \$200, payable to NAMA, to Allein Stanley, 136 Homeplace Drive, Mount Holly, NC 28120. Persons sharing a room may use the same form.

1. Name _____

1. ☐ Male ☐ Female

1. Address _____

1. Phone _____

2. Email _____

3. I wish to room with _____

4. Dietary requests _____

5. Bedding preference: ☐ Double ☐ Single

1. Name _____

1. ☐ Male ☐ Female

1. Address _____

1. Phone _____

2. Email _____

3. I wish to room with _____

4. Dietary requests _____

Bedding preference: ☐ Double ☐ Single

Participants at this foray will be limited to 50 persons, double occupancy. There are no private rooms. The cost of the foray covers 3 nights lodging and 8 meals beginning with an evening meal on Thursday, Sept. 28, and ending with breakfast on Sunday, October 1.

Liability waiver: By signing below, I release the North American Mycological Association, its officers, and its members from any and all liability and loss arising from any accident, injury, or illness which may result from activities of the NAMA regional foray at Wildacres.

Signature #1 _____

Signature #2 _____

Date _____

Date _____

For additional information call (704) 827-1939 or email <wildacres@namyco.org>.

Book Reviews, cont. from page 9

Fungi in Ecosystem Processes, by John Dighton. *Mycology*, Vol. 17. New York: Marcel Dekker, Inc., 2003. ISBN 0-8247-4244-3 (hard-bound) 432 pp; \$175.00.

Some years ago a group of ecologists/economists attempted to estimate the economic value of "ecosystem services," everything from the commodity value of natural resources like timber to less obvious things like climate regulation, waste

treatment, and flower pollinators needed for production of crops. The bottom line is that the value of natural ecosystems is, in the authors' words, "big potatoes"—at least three times the value of all the goods and services produced throughout the world (Costanza *et al.*, *Nature*, Vol. 387:253–60, May 25, 1997). Not many of us appreciate that. Even fewer realize that fungi are an indispensable part of nearly all these ecosystems, thus making us utterly dependent upon them, even as they are destroyed or degraded.

If you've familiarized yourself with the general roles of fungi in nature (a good way to do this would be through reading *Fungi*, by Brian Spooner and Peter Roberts (see the review following this one) and are ready to learn more about the nuts and bolts of their activities, this book can help you take that next step.

John Dighton directs the Pine-lands Field Station, in the New Jersey pine barrens and is a professor at Rutgers University. His

Continued on page 14

The North American Mycological Association

NAMA '06

Hinton Training Center, Hinton, Alberta, Canada

Thursday, August 17th, through Sunday, August 20th, 2006

Ann Bornstein, Registration
336 Lenox Ave., Oakland, CA 94610-4675
<gramma.ann@att.net> • Tel. (510) 839-2487

*Complete both sides of this form and send to Ann Bornstein with your check, payable to **NAMA '06**.*

Name(s): _____

Address: _____

City, State, Zip: _____

Phone: _____ E-mail: _____

Names and club affiliation for name tags: _____

Assign roommate: ☐ Male ☐ Female I want to share a room with _____

REGISTRATION

		U.S. \$	Can \$	
Complete package (Thurs. noon to Sun. lunch)	# _____	@ \$290 each	\$333 each	\$ _____
Single supplement	# _____	@ \$ 78	\$ 90	\$ _____
(includes 3 nights, 9 meals, and all programs)				
Hinton Campground Camping	# _____	@ \$252	\$290	\$ _____
(includes programs, 6 meals, no breakfasts)				
NAMA Trustees meeting Wed. August 16th	# _____	@ \$ 65	\$ 75	\$ _____
Single supplement	# _____	@ \$ 40	\$ 46	\$ _____
(includes 2 nights, breakfast and lunch only)				
NAMA membership (required if not current)	# _____	@ \$ 35	\$ 40	\$ _____
Late fee (after July 1)	# _____	@ \$ 50	\$ 57	\$ _____
Mycology student discount: subtract	# _____	-\$100	-\$115	\$ _____
School _____				
Commuters: (all programs, lunches and dinners)	# _____	@ \$252	\$290	\$ _____
Total				\$ _____

Do you require vegetarian meals or have other special concerns? _____

Are you a vendor? Items for sale _____ Amt. of space desired _____

We must have a signed release for all adults attending the foray. See next page.

LIABILITY RELEASE AND PROMISE NOT TO SUE

I understand that there is some risk in participating in a mushroom foray and conference: all those risks one assumes by being away from home, risks associated with moving about in fields and woods, risks involved in eating wild mushrooms, risks of losing personal property by theft or misplacement, and all other expected and unexpected risks.

In registering for or attending this foray, I agree to assume total responsibility during this event for my own safety and well-being, and that of any minor children under my care, and for the protection of my and their personal property. I release the North American Mycological Association (NAMA), its trustees, officers, employees, contractors, and all other persons assisting in the planning and presentation of this event from liability for any sickness, injury, or loss I or any minor children under my care may suffer during this event or as a result of attending and participating. I further promise not to file a lawsuit or make a claim against any of the persons listed above, even if they negligently cause me or my minor children injury or loss. Finally, I agree to hold NAMA harmless from any liability it may incur as a result of any damages to Hinton Training Center property that I may cause.

This release and promise are part of the consideration I give in order to attend this event. I understand that it affects my legal rights. I intend it to apply not only to me but to anyone who may have the right to make a claim on my behalf.

Signature 1: _____ Date: _____

Print Name 1: _____

Signature 2: _____ Date: _____

Print Name 2: _____

VOLUNTEER OPTIONS

If you can help in any way, please let us know. The volunteer time of our members is what continues to make NAMA forays such a success and great time for everyone. The coordinator will contact you with details prior to the foray.

☐ Display & identification area _____
☐ Set up ☐ Assist identifiers ☐ Clean up

☐ Mycophagy _____
☐ Set up ☐ Preparation (Sat.) ☐ Clean up

☐ Raffle _____
☐ Solicit prizes prior to foray ☐ Assist at foray

☐ Other: _____

***From the Editor:** I hope you're enjoying your current issue of THE MYCOPHILE. The theme this issue is "Mycoparasites," a topic that's a particular favorite of mine. I want to give an extra big "Thanks" to all who contributed articles and provided spectacular photos for this issue!*

Bleeding *Mycena* Pinmold

by Steve Nelsen

Few lower fungi are of much interest to people who walk in the woods looking for mushrooms because most are microscopic. The Bleeding *Mycena* pinmold is an exception that is big enough to see easily and is relatively common. The Bleeding *Mycena*, *Mycena haematopus* (Fries) Quélet, is called "without question one of the commonest and one of the most easily identified of all *Mycenae*" on page 212 of Bessette, Bessette, and Fischer (BB&F), *Mushrooms of Northeastern North America*, and it appears in essentially all handbooks. The cap color varies from pinkish to reddish-brown with age, but it is the dark red-brown juice that oozes from the stem when it is broken which makes this species easy to identify (see photo on page 15 of this issue).

BB&F is the only book I have which names and illustrates the pinmold that the Bleeding *Mycena* gets as *Spinellus fusiger*. It is a member of a large group of lower fungi called Zygomycetes, which includes bread molds, fly fungi, animal traps, and *Pilobolus*, the spore thrower. It is a Subphyllum, Class, or Subclass (with slight difference in endings sometimes), depending on where you look. Especially the higher groupings of fungi appear to be totally a matter of taste, and hardly anybody seems shy about raising or lowering groups to suit himself. Zygomycetes have an aseptate mycelium; that is, the threads that make up the main part of the fungus (and are hidden in what is growing upon) are long tubes instead of being divided into sections with partitions, as with higher fungi. The pinmolds are in Family Mucoraceae (the Fly Fungus family), one of nine in the large Order Mucorales, which contains such economically important fungi as the bread molds. Pin molds are characterized by production of fruiting bodies with relatively long tubes having an enlargement at the end bearing the spores. This pin mold is much larger than most, relatively

common in wet weather, and visually striking when the light catches the "hairs." You should look for it whenever you see Bleeding *Mycena*, which is likely on decorticated logs in oak woods anytime from late May until frost. A Google search showed that it was Tom Volk's March 2004 Mushroom of the Month (they reminded him of Albert Einstein) and gives other pictures of it on *Mycena epipterygia* and *M. pura*.

[Steve is a member of the Wisconsin Mycological Society. This article was first printed in the WMS newsletter and is reprinted with the permission of the author. —Britt]

POETRY CORNER

"Spinella, je t'adore!"

by Maggie Rogers

Mycena with a furry wig?
What is this thing you've found?
Growing on a rotting log,
Or on the mossy ground?

Take out your magnifying lens
To see these hair-fine threads,
And note the wee black sporoid caps
Atop their glistening threads.

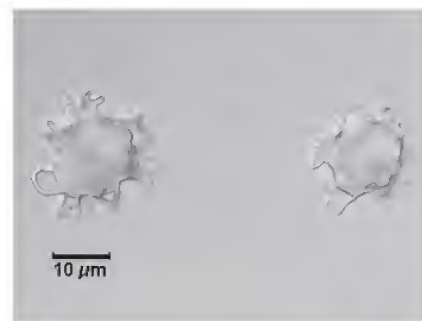
Inside (a microscope you'd need)
You'd find miniscule spores
Maturing from *Mycena*'s rich flesh,
The "rhomboid mitospores."

How do spores find that pink
mycena
Favorite, on its mossy bed?
They leave that cap and float in breezes:
"*Mycena*! Dead ahead!"

What is the name, you'll surely ask?
"Genus *Sporella*; sp. *fusiger*, (Family *Mucor*)."
But to most of us its name's just
"Pin mold . . ."
"*Spinella*, je t'adore!"

Outlandish Oddballs, continued
from page 1

America and Europe, but is much more easily recognized when the initially whitish surface of the cap becomes covered with a brownish powder. It then looks much like a brown puffball. Again the thick gills of this species are often rudimentary or even lacking, and the organism has to find another way of creating effective spores for distribution. This time it is the surface of the cap which transforms itself into "chlamydospores," and these are what make up the brown powder on the cap. Not surprisingly, it carries a common name of Powdery Piggyback in some quarters. Michael's photo of the chlamydospores (below) shows them as remarkably star-like with blunt spines all around, and it is this feature that gave rise to the species epithet *asterophora*, meaning "star-bearing." This species also is known by an alternate name, *Asterophora lycoperdoides*: the species epithet means "like a puffball."



Nyctalis asterophora chlamydospores.

Maybe now you will recognize this pair when you are lucky enough to find them.

[Used with permission from Tony Wright, John Sparling and Michael Warnock, members of the Mycological Society of Toronto, who teamed up on the genus *Nyctalis* for their club's newsletter, "Mycelium," Vol. 31 No. 4, Oct.–Dec. '05. Incidentally, Tom Volk points out that the genus *Nyctalis* is synonymous with *Asterophora* and that, technically, the latter is the preferred name. You can see his website for details. —Britt]

background is primarily in ecology, not mycology, and much of his research involves ecosystem aspects of ectomycorrhizas. The book arose from a manuscript he prepared for a graduate course he teaches called *Fungi in Ecosystems*. Lacking a suitable textbook for the class, he decided to write his own. Given this original target audience, you'll need some familiarity with college-level biology, fungi, and soils to get the most out of it.

After a general introduction in Chapter 1, six main topics are treated in one lengthy chapter each: Fungi and primary productivity: making nutrients available; Fungi and primary productivity: plant growth and carbon fixation; Fungi, secondary productivity, and other fungal-faunal interactions; Fungi and population and community regulation; Fungal interactions with humans; and Synopsis and outlook to the future. Generally the fungi are discussed in four groups—mycorrhizal, saprotrophic, pathogenic, and lichen-formers—and the emphasis is on what they are doing, rather than what they are.

Dighton poses the main threads that flow through the volume as four questions: (1) How have fungi become adapted to survive within the constraints of the environment and other organisms around them? (2) How do fungi function in maintaining the status quo of ecosystems? (3) How do fungi alter the environment of the ecosystem so as to withstand perturbation? and (4) How do fungi influence the population and community structure of other organisms?

A wealth of information gleaned from Dighton's own research and well over 1000 references is presented to address those questions. The text is supported by a large number of tables and black-and-white graphs, charts, and diagrams, mostly redrawn from published sources. The organization, writing, and overall presentation are adequate—good enough for those with a pre-existing interest in the material,

but not of a caliber likely to attract many new converts to matters of ecosystem mycology. Given that, it's difficult for me to recommend this book in light of its high price. At \$175.00, it's not likely to be used in many classes and thus will reach few in its original audience of university students, not to mention general readers who might want to know more about the activities of fungi in the world around us. If money's no object, or you have access to a university library, *Fungi in Ecosystem Processes* is worth checking out. If neither of those conditions applies to you, then you may prefer to wait for a more accessible treatment of this essential but little-appreciated subject.

—Steve Trudell, Seattle, Washington

Fungi, by Brian Spooner and Peter Roberts. The New Naturalist Series. New York: Collins, 2005; 594 pp. ISBN 0-00-220153-4 (paper). \$45.00

This recent addition to the long-running Collins New Naturalist Series replaces the popular seventh volume, *Mushrooms and Toadstools*, written by John Ramsbottom in the early 1950s and in print until the mid 1980s. According to the publisher, "The aim of this series is to interest the general reader in the wildlife (in a broader sense than we use in North America) of Britain by recapturing the enquiring spirit of the old naturalists. The editors believe that the natural pride of the British public in the native flora, fauna, and fungi, to which must be added concern for their conservation, is best fostered by maintaining a high standard of accuracy combined with clarity of exposition in presenting the results of modern scientific research. Other volumes in the series deal with topics such as lichens, bats, moths, and regions of Britain including the Lake District, Northumberland, and the seashore.

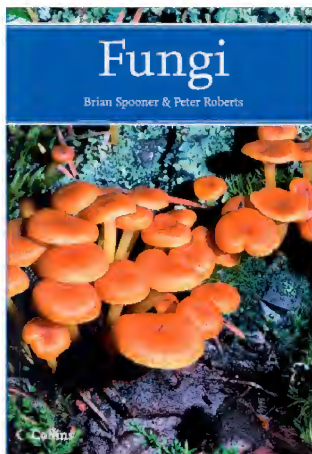
As a rule, most people know little or nothing about such things as lichens, moths, bats, and fungi (and don't care about them), so I consider

Collins's longstanding commitment to including under-appreciated organisms in this series quite praiseworthy. The authors of this new volume are both mycologists at the Royal Botanic Gardens, Kew, and are well known in mycological circles. In keeping with the editors' intent for the series, they present in accessible fashion a wealth of interesting and up-to-date information about what fungi do and why they are important.

The 18 chapter titles give a good sense of what to expect: Neither plants nor animals; Evolution and diversity; Agents of decay; Mycorrhizae: promoters of growth; Partners and providers; Parasites and predators; Dispersal; Grass and grassland; Trees and woodland; Dunes and heathland; Freshwater; Marine and salt marsh; Specialised natural habitats; Manmade habitats; Fungi and health; Folklore and traditional use; Food and technology; and Conservation.

In addition to presenting much widely known material, Spooner and Roberts have done an excellent job of culling many interesting findings about fungi from the recent, as well as the not-so-recent, research literature. For instance, I was pleased to see the story of how chlorophyll-free plants such as Indian pipe and pine drops derive their nutrition from ectomycorrhizal fungi—they are not saprophytes as many botany books and field guides would have you believe. They also call attention to the frequent association (at least spatially) of fruiting bodies of *Amanita muscaria* and *Boletus (Chalciporus) piperatus*. I have observed these two comingling in several different areas in North America and Europe, but this is the first reference I have run across of anyone else noticing the same thing. The authors speculate that there may be a parasitic relationship between the two fungi, in much the same fashion that species of *Gomphidius* have been shown to be parasitic on *Suillus mycorrhizas*.

The writing generally is clear and easy to follow, with the exception of an occasional passage that



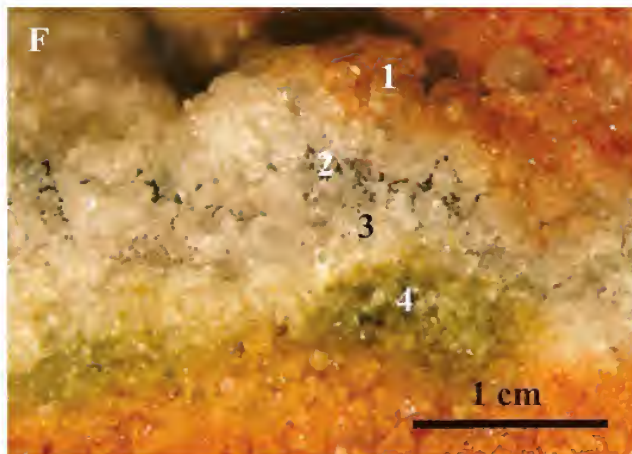
left me scratching my head. Technically, the information is sound, although in the area I know best (mycorrhizas) some points were a bit out-dated. However, given the wide range of fungi and fungal activities covered in the book, it would not be realistic to expect any one or two authors to be up-to-the-minute on everything. The text is illustrated primarily with color photographs, most

of which are of high quality. There also are a few black and white photographs, line drawings, and reproductions of color paintings.

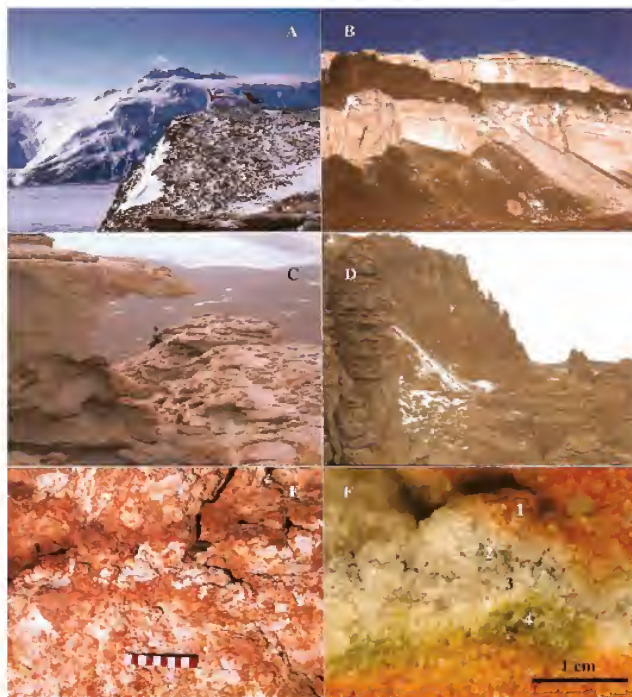
Overall, this is an excellent look at what fungi are doing out there. Given the amount of information covered, it is probably best approached by taking it in a bit at a time, rather than trying to assimilate all 594 pages straight through. Anyone who spends even a little time among its pages will learn something new—probably many things. An interesting and worthwhile read. —Steve Trudell, Seattle, Washington



Mycena haematopus May 26 2001, found in Wildcat Mountain State Park. (See article, page 13.)



Illustrations from *Fungi of the Antarctic: Evolution under Extreme Conditions* (see review, page 7). Above: Endolithic fungal growth; fungi are the blackened areas inside the broken rock [detail]. Below: Barren habitat of Antarctic fungi.



Forays and Announcements, continued from page 4

happy to have you here. If you want to call, my direct line is (507) 535-1007. From La Crosse you can make a local call to my cell phone: (608) 498-3728. You can also call this number from anywhere and talk to me or leave a message.

It's still very surreal to think of having someone else's heart in me, and most often I still can't believe it.

Sorry for the mass email. I hope all is well with all of you. —Tom

North American Mycological Association

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Newsletter of the North American Mycological Association
THE MYCOPHILE

Mushroom of the Month

Outlandish oddballs: *Nyctalis parasitica* chlamydospores. See page 1 for the rest of the story.

